Horsley Witten Group
Sustainable Environmental Solutions
294 Washington Street • Suite 801 • Boston, MA 02108
857-263-8193 • horsleywitten.com

January 26, 2017

Ms. Beth Suedmeyer
Environmental Planner
Planning and Community Development
Town of Sudbury
278 Old Sudbury Road
Sudbury, Massachusetts 01776

Re: 2nd Peer Review of The Coolidge at Sudbury Phase 2
187 – 189 Boston Post Road
Sudbury, Massachusetts

Dear Ms. Suedmeyer and Board Members:

The Horsley Witten Group (HW) is pleased to provide the Sudbury Zoning Board of Appeals (ZBA) with this letter report summarizing our second engineering peer review of The Coolidge at Sudbury Phase 2 project located at 187 – 189 Boston Post Road, Sudbury, Massachusetts (Property). The plans and calculations were prepared for B'nai B'rith Housing New England, Inc. (Applicant) by Hancock Associates.

The following documents and plans prepared by Hancock Associates in response to our January 3, 2017 peer review letter, were received by HW:

- Memorandum to Zoning Board of Appeals from the Conservation Commission, dated January 9, 2017;
- Response letter from Hancock Associates dated January 20, 2017;
- Letter prepared by Sudbury Water District, dated January 24, 2016 (possibly misdated);
- Letter prepared by Nixon Peabody, dated January 24, 2017;
- Stormwater Report for The Coolidge at Sudbury Phase 2, dated January 17, 2017; and
- Comprehensive Permit Site Plan, The Coolidge at Sudbury 2, revised January 17, 2016 (appears to be misdated) which includes:
  - Title Sheet C1
  - Notes C2
  - Existing Conditions C3
  - Preliminary Subdivision C4
  - Preliminary Layout Plan C5
  - Preliminary Grading and Utility Plan C6
  - Preliminary Landscape Plan C7
  - Details D1 and D2

Stormwater Review

Our follow up comments are provided below in **bold**:

1. *Standard 1: No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

   The proposed stormwater management design for the Property contains no new proposed stormwater conveyance outfalls. The new proposed stormwater management system includes a series of catch basins and storm drain pipes which discharge to a subsurface Stormtech Isolation Chamber for water quality pretreatment prior to discharging into an infiltration basin located along the southeast corner of the property. Stormwater conveyed to the infiltration basins that does not infiltrate, discharges to the wetlands via a proposed stone weir overflow structure.

   Based on calculations provided for Standard 2 below, it appears that the infiltration basin weir overflow, located greater than 50 feet from the on-site bordering vegetated wetlands (BVW) will not overtop (i.e., discharge) during the 100-year, 24-hour storm event and therefore it is expected that stormwater will not cause erosion in the wetlands on the Property.

   The Applicant appears to be in compliance with Standard 1.

   No further comment necessary.

2. *Standard 2: Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.*

   The Applicant has described the Pre-Development and the Post-Development watershed areas, drainage conditions, and discharge values as documented in the Stormwater Management Report for the Property. HydroCAD output was included in Appendix I of the Stormwater Report. To verify compliance with Standard 2, HW has the following recommendations:

   a. The calculations provided for the peak discharge rates do not include the 25-year design storm event (equal to 6.0 inches). In accordance with Section 8.A.3.f of the Sudbury Stormwater Regulations, analyses shall be analyzed for the 1-inch and the 2, 10, 25, and 100-year design storms under Pre-Development and Post-Development. HW recommends the Applicant provide calculations for the 25-year 24-hour design storm event.

      The Applicant has provided the 25-year 24-hour design calculations as requested. The flow does not appear to be increasing over predevelopment conditions.

   b. The HydroCAD output does not provide calculations for the 1-inch storm event in accordance with Section 8.A.3.f of the Sudbury Stormwater Regulations. Furthermore, the HydroCAD output does not provide detailed calculations for the 10-year storm event,

to assist in verifying pond inflows, outflows and elevations. HW recommends that the Applicant provide HydroCAD output for the 1-inch and 10-year storm events.

The Applicant has provided the 1-inch and the 10-year 24-hour design calculations as requested. The flow does not appear to be increasing over predevelopment conditions; however the volume increases for all storm events. The Applicant is utilizing the storage within the isolated/bordering vegetated wetland to accommodate the increase in volume. The raising of the wetland by approximately 3 inches is considered an alteration to a resource area subject to protection in accordance with the Wetlands Protection Act. HW recommends that the Applicant obtain an Order of Conditions from the Sudbury Conservation Commission.

c. The Post Subcatchment Plan and the HydroCAD model do not appear to be consistent. The Post Subcatchment Plan identifies subcatchments 10A, 10B and 25; however, these are not identified in the HydroCAD model. The Post Subcatchment Plan identifies "Sub 19"; however, the model has two subcatchments labeled as 19 (i.e., "19S A" and "19S B"). Further, the HydroCAD model has a subcatchment 48S, which drains to the street and is not delineated on the Post Subcatchment Plan. HW recommends that the Applicant revise the Post Subcatchment Plan and/or the HydroCAD model for consistency.

   The Applicant has adequately addressed this comment.

d. A time of concentration (Tc) value for Subcatchments 20f and 48S has not been included in the HydroCAD model. HW recommends that the Applicant provide a Tc value for these subcatchments.

   The Applicant has addressed this comment; however they have included a statement that the flow from 20f decreases when the flow from 20f appears to increase over the original submission. This increase does not impact the overall stormwater management design.

e. Details for the proposed best management practices (BMPs) including the isolator chambers and Stormtech MC-3500, grass pavers and infiltration basin have not been provided. To function as designed the BMPs must be constructed with the storage included in the modeling calculations. HW recommends that the Applicant provide details and cross sections for the BMPs and a condition be included in any approval that requires an as-built of the BMPs to ensure that the systems have the required capacity.

   As previously stated, to function as designed the BMPs must be constructed with the storage included in the modeling calculations. HW recommends that the Applicant provide complete details and cross sections for the BMPs and a condition be included in any approval that requires an as-built of the BMPs to ensure that the systems have the required capacity. The Applicant has suggested that the Building Inspector will be responsible for the final review of these details, if the project will be presented to the Conservation Commission for an Order of

Conditions then the Conservation Commission will require complete details. It is HW's opinion that the stormwater details should be prepared and reviewed prior to final permitting of the ZBA or the Conservation Commission.

f. In accordance with the MSH, an infiltration basin should maintain one foot of freeboard. HW recommends that the Applicant verify that the required freeboard has been provided.

The Applicant has adequately addressed this comment and is providing approximately 10.5 inches of freeboard.

g. In accordance with the MSH, HW recommends that the Applicant verify and/or provide additional details on the following design elements for the infiltration basin:

- Location of one (1) monitoring well, which shall be installed in the basin floor for every 5,000 square feet of basin floor.

  The Applicant has adequately responded to this comment.

- A minimum of three borings for each infiltration basin are required. The Site Plans indicate only two test pits (TP-106 and TP-107) within the infiltration basin.

  The Applicant's suggestion to provide three borings prior to construction appears reasonable.

- Inlets shall be stabilized (i.e., with riprap) to prevent incoming flow velocities from scouring the basin floor.

  The Applicant has adequately responded to this comment.

- Infiltration basins must include an overflow outlet in addition to an emergency spillway.

  The Applicant has adequately responded to this comment.

- A drawdown device shall be designed to draw down the basin for maintenance purposes.

  The Applicant has adequately responded to this comment.

h. In accordance with the MSH, a minimum of two (2) test pits shall be provided in the location of proposed subsurface infiltration structures. HW recommends that the Applicant provide the location and test results for a minimum of two (2) test pits in the location of the proposed Isolator Row and Stormtech subsurface structures.

The Applicant has adequately responded to this comment.

i. The Preliminary Landscape Plan identifies the proposed infiltration basin, as identified on the Preliminary Grading and Utility Plan, as a detention basin. HW recommends that the Applicant revise the discrepancy.

The Applicant has adequately responded to this comment.

3. *Standard 3 requires that the annual recharge from post-development shall approximate annual recharge from pre-development conditions.*

a. There appears to be a discrepancy between the available storage calculations provided for the Isolator Row and Stormtech Chamber in the Stormwater Report when compared to the HydroCAD values. HW recommends that the Applicant provide clarification on the available storage provided by these BMPs.

The Applicant has adequately responded to this comment.

b. HW recommends that the Applicant provide drawdown analysis and calculations for the proposed Grass Pavers and Stormtech subsurface structures.

The Grasspaves have been included in the calculations to meet the recharge requirements. HW recommends that the Applicant provide the necessary documentation to verify that the Grasspaves can provide the recharge credited.

c. Based on information provided for Test Pit TP-107, the depth to estimated seasonal high groundwater from the bottom of the proposed infiltration basin is 2.5 feet. In accordance with MSH Volume 3, Chapter 1, page 28 a mounding analysis is required when the vertical separation from the bottom of an exfiltration system to seasonal high groundwater is less than four (4) feet *and* the recharge system is proposed to attenuate the peak discharge from the 10-year or higher 24-hour storm. Based on the HydroCAD summary output provided for the 10-year storm, the infiltration basin infiltrates the entire peak and associated storm volume without discharging to the wetland. HW recommends that the Applicant provide a mounding analysis to demonstrate that the groundwater mound that forms under the recharge system will not break out above the land or water surface of the adjacent wetland.

The Applicant has provided an outlet structure with a low flow orifice; however the HydroCAD calculations indicate that the low flow orifice is not reached for the 10-year storm event. HW recommends that the Applicant provide the required mounding analysis.

4. *Standard 4 requires that the stormwater system be designed to remove 80% Total Suspended Solids (TSS) and to treat 1.0-inch of volume from the impervious area for water quality.*

a. The tributary impervious area associated with calculations provided for the water quality volume required to the infiltration chamber, does not match the inflow impervious area in the HydroCAD model. HW recommends that the Applicant verify the tributary

impervious drainage area and revise the water quality calculations or the HydroCAD model as appropriate.

The Applicant has adequately responded to this comment.

b. Calculations for the Stormtech Isolator Row refer to "Appendix V", which were not provided in the Stormwater Report. HW recommends that the Applicant provide any and all necessary design calculations used to size and design the Stormtech subsurface structures.

The Applicant has adequately responded to this comment.

c. Based on the provided Site Plans, it does not appear that the extended detention basin, built as part of Phase I, discharges to a grass channel, as indicated in the Treatment Chain 1 table. HW recommends that the Applicant verify that 80% TSS removal is achieved for the Project.

The Applicant has adequately responded to this comment.

5. *Standard 5 is related to projects with a Land Use of Higher Potential Pollutant Loads (LUHPPL).*

The proposed project is not considered a LUHPPL; therefore Standard 5 is not applicable.

No further comment is necessary.

6. *Standard 6 is related to projects with stormwater discharging into a critical area, a Zone II or an Interim Wellhead Protection Area of a public water supply.*

The proposed development does not appear to be within a critical area; therefore Standard 6 is not applicable.

No further comment is necessary.

7. *Standard 7 is related to projects considered Redevelopment.*

The proposed project is not considered a redevelopment; therefore Standard 7 is not applicable.

No further comment is necessary.

8. *Standard 8 requires a plan to control construction related impacts including erosion, sedimentation or other pollutant sources.*

The Applicant has indicated that "construction period controls will be provided in the stormwater pollution prevention plan in the final submittal". HW recommends that any approvals granted for this project require that the Application provide an erosion control plan

illustrating controls to mitigate erosion, sedimentation and other pollutant sources. HW also recommends that this plan include specific details and locations of erosion and sedimentation control practices and be in compliance with Section 8.B of the Sudbury Stormwater Regulations. Prior to construction this plan should be approved by the Sudbury Conservation Commission.

The Applicant is in agreement that a SWPPP will be provided prior to construction. Again the Applicant suggests that this be reviewed by the Building Inspector. It is HW's opinion that the Sudbury Conservation Commission should have an opportunity to review and comment on this document.

9. *Standard 9 requires a Long Term Operation and Maintenance (O & M) Plan to be provided.*

The Applicant provided a Stormwater Operation and Maintenance Plan for the Property. HW recommends the following:

a. The Applicant has not specified the frequency of construction inspections. To ensure compliance with the Town of Sudbury Stormwater Regulations, HW recommends that the wording in the Applicant's O&M plan state that site inspections, including those for erosion/sedimentation control purposes, will be conducted within 24 hours after the end of a storm event of 0.5 inches of precipitation or greater. These frequencies of inspections should occur from the start of construction until the site is permanently stabilized.

The Applicant has adequately responded to this comment.

b. In compliance with MSH Volume 2, Chapter 2, page 92, HW recommends that the Applicant add the following O&M requirements to the infiltration basin area:

The Applicant has adequately responded to these comments.

- Items to check during inspections include: signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth on the embankments, condition of riprap, sediment accumulation and the health of vegetation.

- At least twice per year, mow the buffer area, side slopes, and basin bottom. Remove grass clippings and accumulated organic matter to prevent an impervious organic mat from forming. Remove trash and debris at the same time. Use deep tilling to break up clogged surfaces, and revegetate immediately.

- Remove sediment from the basin as necessary, only when the floor of the basin is thoroughly dry.

c. HW recommends that the owners of the Property be made fully aware that snow should not be stockpiled within the stormwater BMPs including the sediment forebays, water quality swales, detention basins and infiltration basins.

The Applicant has acknowledged this comment.

10. *Standard 10 requires an Illicit Discharge Compliance Statement to be provided.*

    The Applicant has stated that an Illicit Discharge Compliance Statement is not applicable. However, in accordance with the MSH, an Illicit Discharge Compliance Statement must be submitted. HW recommends that the Applicant provide the Illicit Discharge Compliance Statement to the Town of Sudbury Conservation Commission prior to the start of construction.

    The Applicant has acknowledged this comment.

11. It does not appear that the Applicant provided calculations for design of the proposed closed storm drain network. HW recommends that the closed drainage system design be submitted for review and approval.

    The Applicant has adequately addressed this comment.

12. The Applicant is proposing a private well for irrigation for the proposed Project. In accordance with Section 8.A.4 of the Sudbury Stormwater Regulations to conserve water supplies and maximize recharge it may be appropriate for some sites to store and reuse clean runoff (i.e., from roofs) for reuse on the site for irrigation. HW recommends that the Applicant demonstrate why a private well was chosen for irrigation as opposed to a reuse system.

    HW defers to the ZBA for the acceptance of the Applicant's response to this comment.

Conclusions

HW recommends that the Sudbury Zoning Board of Appeals require that the Applicant address these comments as part of the ZBA permitting process. The Applicant is advised that provision of these comments does not relieve him/her of the responsibility to comply with all Town of Sudbury Codes and Bylaws, Commonwealth of Massachusetts laws, and federal regulations as applicable to this project. Please contact Janet Bernardo at jbernardo@horsleywitten.com or at 857-263-8193 if you have any questions regarding these comments.

Sincerely,

HORSLEY WITTEN GROUP, INC.

Janet Carter Bernardo, P.E.
Senior Project Manager